

APPENDIX 7: Optional Written Exercises

The following exercises can be used in place of the hands-on exercises or as supplemental activities. Exercise worksheets and answers are provided.

Exercise 1) Identify Common Work Practices that Create Dust

Exercise 2) Review Set-Up Methods

Exercise 3) Identify Safe Work Practices

Exercise 1: Instructions

Objective: Identify common work practices that produce a lot of dust and debris.

Length: Total time: 20 minutes; 10 minutes to answer; 10 minutes to report and debrief.

Directions:

1. Introduce the exercise objective and describe what each group should do.
2. Determine the number of groups of 3 to 5 people (group size should be at least 3 or 4 people and up to 5 people if the class is large). Try to keep the number of groups to no more than 6 or 7 if the class is large. The table below may help you determine group size and number of groups. Have participants count off up to the number of groups to assign to groups.

Class Size	Number of Groups	Group Size
1-5	1	1-5
6-8	2	3 or 4
9-11	3	3 or 4
12-14	4	3 or 4
15-19	5	3 or 4
20-24	6	3 or 4
25-30	6	4 or 5

3. Tell class they have 10 minutes to answer all four questions, and then we will have a class discussion on the answers each group develops. Each group should select a spokesperson to present the group's answers to the rest of the class.
 - Give 5, 2, and 1-minute warnings of time remaining.
 - Circulate around the room to ensure that participants understand their roles.

Debriefing Procedure

Take 10 minutes for debriefing.

- Have one group present its answers to questions 1 and 2.
- Ask whether other groups had a different ranking for the work practices, and if so to please share their ranking for question 1 and their answer to question 2. If no other group volunteers, choose a group to present their answers to questions 1 and 2.
- The point of this discussion is to help participants see that the types of work practices they may currently use can create a lot of dust and debris and that there are some common reasons for the amount of dust and debris created.

- Ask another group what they answered for question 3. Then ask other groups if they agree or disagree. If they disagree, ask them to say why.
- Finally, ask another group to answer question 4. Ask the other groups if they would do something different. If no one answers, choose a group and ask them to respond. Try to make sure that each group has had a chance to participate and answer at least one question.

Exercise 1: Answers

Objective: Identify common work practices that produce a lot of dust and debris.

Length: 20 minutes.

Directions: In groups of 3 to 5 take 10 minutes to answer the questions below. Assign one person to report your group's answers to the rest of the class.

1. Rank the work practice descriptions according to the amount of dust and paint chips you think they make. In the table below, under the column labeled Rank, write:

- "1" next to the work practice that makes the most dust and debris.
- "2" next to the work practice that makes the second most amount of dust and debris.
- "3" next to the work practice that makes the third most amount of dust and debris.

Continue until you have ranked each work practice according to how much dust and debris you think it will make. A smaller number means that you think the work practice will create more dust or debris than a larger number.

If you think that some work practices make about the same amount of dust or debris you can give them the same rank. If you think that each practice makes different amounts of dust, rank them from 1 to 7. If you think you need more detail to make a decision, just make that detail part of your assumptions and be sure to note that assumption when explaining your ranking.

Work Practice Description	Rank
A. Using a power sander with no vacuum attachment to remove interior paint from a plaster wall.	1
B. Hand sanding a small (less than 2 square feet) area for surface preparation on an interior room where the paint is in good condition.	5
C. Ripping out old kitchen cabinets in a 50 year-old house where the paint on the walls and cabinets is in good condition (e.g., it is not peeling or flaking).	2
D. Repairing a sticking window. Loosen the painted sashes, remove inside stop molding, remove top and bottom sash, use a power planer to remove old paint, reglaze and repair the sash as necessary, repair and paint the jamb, reinstall the sash.	2
E. Removing old carpeting placed over a hardwood floor in one room.	3
F. Demolishing one interior wall using hand or power tools.	2
G. High pressure power washing or hydro blasting exterior paint.	4

2. For the work practice(s) that you ranked #1 (it makes the most dust and debris), tell why you think it makes the most dust or debris.

Work practice A creates the most dust and debris. Any sanding on a surface area more than 2 square feet generates a lot of dust. Recent studies by the National Institute for Occupational Safety and Health (NIOSH) indicate that power sanding without a HEPA filter attachment creates the most dust.

Different groups could come up with different answers. If they do, ask them why. Underlying assumptions about the nature of the work practice may have contributed to their decision. Different assumptions may render different answers acceptable.

3. For the work practice(s) that you ranked last (it makes the least amount of dust and debris) tell why you think it makes the least amount of dust and debris.

Hand sanding less than 2 square feet for surface preparation usually generates less dust and debris than the other activities listed in question 1. This is the smallest area in the list of work practices. In addition, hand sanding is unlikely to use as much pressure on the surface or move as fast as a power sander. The combination of small surface area and less total “activity” means that less dust and debris is usually created.

Different groups could come up with different answers. If they do, ask them why. Underlying assumptions about the nature of the work practice may have contributed to their decision. Although unlikely in this case, different assumptions may render different answers acceptable.

4. If you actually did any of the jobs described above, what would you do to clean up when the job was finished?

Most contractors will sweep or vacuum obvious dust from the interior work area and dispose of any debris or garbage. They will also pick up drop cloths for reuse at another work site.

If contractors do more than this, there is usually less to learn in order to perform clean-up activities that are safer and more effective.

Exercise 1: Worksheet

Objective: Identify common work practices that produce a lot of dust and debris.

Length: Total Time: 20 minutes.

Directions: In groups of 3 to 5 take 10 minutes to answer the questions below. Assign one person to report your group's answers to the rest of the class.

1. Rank the work practice descriptions according to the amount of dust and paint chips you think they make. In the table below, under the column labeled Rank, write:
 - 1 next to the work practice that makes the most dust and debris.
 - 2 next to the work practice that makes the second most amount of dust and debris.
 - 3 next to the work practice that makes the third most amount of dust and debris.
 - Continue until you have ranked each work practice according to how much dust and debris you think it will make. A smaller number means that you think the work practice will create more dust or debris than a larger number.

If you think that some work practices make about the same amount of dust or debris you can give them the same rank. If you think that each practice makes different amounts of dust, rank them from 1 to 7. If you think you need more detail to make a decision, just make that detail part of your assumptions and be sure to note that assumption when explaining your ranking.

Work Practice Description	Rank
A. Using a power sander with no vacuum attachment to remove interior paint from a plaster wall.	
B. Hand sanding a small (less than 2 square feet) area for surface preparation on an interior room where the paint is in good condition.	
C. Ripping out old kitchen cabinets in a 50 year-old house where the paint on the walls and cabinets is in good condition (e.g., it is not peeling or flaking).	
D. Repairing a sticking window. Loosen the painted sashes, remove inside stop molding, remove top and bottom sash, use a power planer to remove old paint, reglaze and repair the sash as necessary, repair and paint the jamb, reinstall the sash.	
E. Removing old carpeting placed over a hardwood floor in one room.	
F. Demolishing one interior wall using hand or power tools.	
G. High pressure power washing or hydro blasting exterior paint.	

2. For the work practice(s) that you ranked #1 (it makes the most dust and debris), tell why you think it makes the most dust and debris.

3. For the work practice(s) that you ranked last (it makes the least amount of dust and debris) tell why you think it makes the least amount of dust and debris.

4. If you actually did any of the jobs described above, what would you do to clean up when the job was finished?

Exercise 2: Instructions

Objective: Review set-up methods to contain lead dust and allow for easier clean-up.

Length: Total Time 30 minutes; 20 minutes to answer; 10 minutes to report and debrief.

Directions:

- Introduce the exercise and the objective. Describe what each group should do.
- Divide the class into groups of between 3 and 5 participants.
- Tell the class that they will have 20 minutes to look at the illustrations and determine the three set-up techniques that do not contain lead dust and identify three techniques that they could use to contain lead dust.

Debriefing Procedure:

Take 10 minutes for the debriefing.

- The point of this debriefing is to help participants gain a clear understanding of the concept of containment—what it is and what it is not—and how to set-up the work space to preserve containment.
- Have one group present their answers for the first illustration. If necessary to save time, ask the group to present only their answers for how to reduce the spread of dust and debris.
- Then ask other groups if they had different answers for the first illustration. If so, select one other group to present and explain their answers. If not, ask other groups why they selected the specific methods in their answer.
- Repeat this process for each illustration. Be sure to select different groups to present on each illustration to ensure that each group has a chance to present.

Exercise 2: Answers

Objective: Review set-up methods to contain lead dust and allow for easier clean-up.

Length: Total Time 30 minutes; 20 minutes to answer; 10 minutes to report and debrief.

Directions: In groups of three or four take 20 minutes to review the three illustrations below and:

- Identify three set-up methods that encourage the *spread* of lead dust beyond the work area;
- Identify three techniques that could be used to *reduce* the spread of lead contaminated dust to non-work areas;
- Assign one person to report your group's answers to the rest of the class.

Illustration 1: Replace Window



Increase the Spread of Dust and Debris:

1) Drop cloths carry lead-contaminated dust to other jobs. 2) Lead-contaminated dust will fall onto the drapes creating a hazard for the residents. 3) Open windows and doors allow dust to be blown into and outside of the house. 4) There is no barrier to indicate that residents should not enter the area.

Reduce the Spread of Dust and Debris:

1) The small child should not be allowed near the work area. 2) Use plastic protective sheeting to cover furniture and the floor. 3) The drapes should be removed from the work area. 4) Barriers should be installed. 5) Adult residents should be told to stay away from the work area and keep children away

Illustration 2: Remove Exterior Paint



Increase Spread of Dust and Debris:

- 1) Paint dust and chips are blowing onto the nearby play area.
- 2) Children are playing nearby.
- 3) The exposed pile of paint chips poses a significant hazard to the residents.

Reduce Spread of Dust and Debris:

- 1) Lay protective sheeting on ground (if using water, lay landscaping mesh to capture paint chips and let water into ground).
- 2) Children should be told to stay away from the work area and a barrier erected.
- 3) The pile of paint chips should be vacuumed up frequently and not left on the ground where wind may scatter them onto the play area.

Illustration 3: Rework and Paint Interior Components



Increase the Spread of Dust and Debris:

- 1) The significant amount of dust being generated and the ability to remove the door suggest that a dust room should be set-up.
- 2) There is no protective sheeting on the floor.
- 3) The windows and doors are open.
- 4) There is also no evidence of any barriers or signs limiting access to the work area.

Reduce the Spread of Dust and Debris:

- 1) Create a dust room.
- 2) The floors and windows should be lined with protective sheeting.
- 3) The entrance to the dust room should have the 2- layer flap system.

Exercise 2: Worksheet

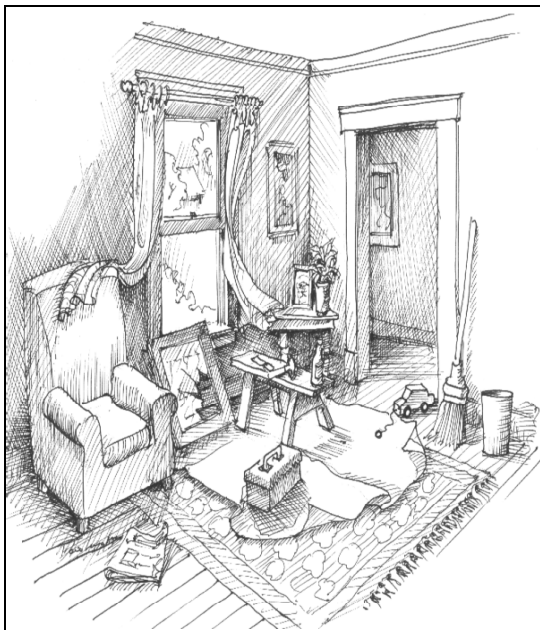
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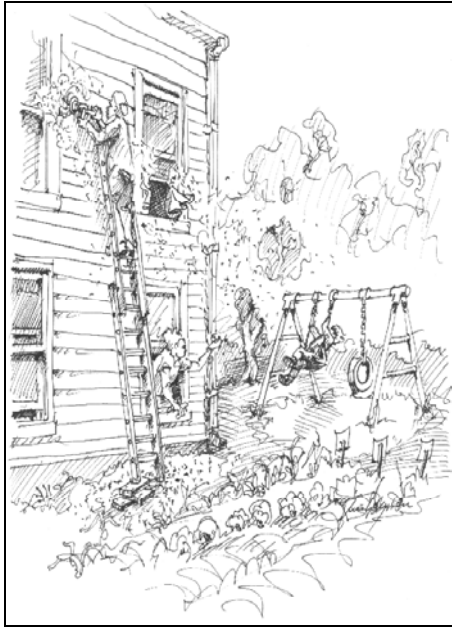
Illustration 1: Replace Window



Increase the Spread of Dust and Debris:

Reduce the Spread of Dust and Debris:

Illustration 2: Remove Exterior Paint



Increase Spread of Dust and Debris:

Reduce Spread of Dust and Debris:

Illustration 3: Rework and Paint Interior Components



Increase the Spread of Dust and Debris:

Reduce the Spread of Dust and Debris:

Exercise 3: Instructions

This exercise is an instructor-lead discussion where participants determine approaches to work tasks using safe work practices. The discussion should lead to an exchange of ideas among the participants on safe approaches to typical jobs.

Instructor's Notes

This exercise is a class discussion. The instructor's job is to present the directions, encourage discussion, manage the responses, write down the participants' ideas, and contribute to the discussion.

Step 1. Explain the instructions to the class: Give them 5 minutes to read the scenario and the jobs described after.

Step 2. The remaining 20 minutes allotted for the exercise is devoted to the participants' suggestion for safe approaches to each job. Starting with the first job, ask the participants for their ideas on how to do the job. Ask them for specific steps, the tools they will need, and what the job should look like when done.

Step 3. As the participants make their suggestions, jot them down on a clear overhead sheet or flip chart for everyone to see and keep track of what has been covered.

Step 4. After getting a complete description, move onto the next job. You should spend about 5 minutes on each before moving onto the next.

Exercise 3: Answers

Objective: Identify safe work practices for typical renovation and remodeling tasks.

Length: Total time: 25 minutes

Directions: Take 5 minutes to read the background and the jobs below. When you are finished, the instructor will ask you and the other participants to contribute approaches to each of the jobs listed below. You may take notes on approaches under each description.

Background

You own a small contracting firm which has been hired by a couple to renovate the interior and exterior of their large Victorian-style home built around 1910. This is a prominent home in the neighborhood (it sits on the corner) and you are looking forward to doing a quality job and getting a good reference. You also like that your truck parked in the driveway with your name on it will make good advertising to the neighbors who drive by. Furthermore, it will keep you and your workers busy for at least three solid weeks.

As the law requires, you give the couple the lead pamphlet *Protect Your Family from Lead in Your Home*. The day before you are to start working, they call and ask you if they have lead-based paint in their home and whether they should be worried about it. (They have a four-year old daughter and plan to remain in the house during the two-week work period). You inform them that, short of having the place tested, you have no way of knowing for sure. To be safe, you tell them that you assume that some layers of paint in the home are lead-based paint.

You get the feeling that they are having second thoughts and might cancel the job. You inform them that there are steps that can be taken to reduce the risk of creating a lead hazard. You also point out that you and two of your steady workers have taken an EPA course on how to do work safely. This seems to reassure them and they tell you to go ahead as planned.

On the Job: Day One

In addition to yourself and your two experienced employees, you have hired a full-time worker to help with the demolition and prep work. You have several specific jobs in mind for this worker which are listed below. Keeping in mind that your clients are concerned about lead-based paint, and that the jobs will create a lot of debris and dust, you want to be sure that the jobs are done right and use safe work practices. You decide that the best course of action is to take the time to explain to the worker, step-by-step, how to do each.

The instructor will ask you and the others in the class to give instructions the new worker. Be clear about what safe work practices you want used, in what order, and the tools that the worker will need. Also tell the worker how you want the work site prepared and what you want it to look like before the next stage of work starts.

The Jobs

How will you tell the new worker to do each of the following jobs?

1. Remove worn green carpet from vestibule, first floor hallway, and staircase. The carpet is tacked to the floor and its edges are covered with quarter round at all of the walls. The carpet is being removed to expose hardwood flooring which is to be refinished.

Mist and pry loose baseboard covering edges of carpet; dispose of by immediately wrapping in protective sheeting and carry out of the work site. Lightly mist carpet with pump sprayer to keep dust down but not to add weight to the carpet. Pull up edges of the carpet and roll to one side, carpet side up. Wrap in protective sheeting, seal with duct tape, and carry away from the work site for disposal. HEPA vacuum dust on the bare floor before beginning refinishing of the floor. Tools used include pry bars, vice grips, misting bottles and pump sprayer, and HEPA vacuum.

2. Enlarge the door size opening in the wall between the living and dining rooms to make way for an enlarged passageway. There is trim at the base of the walls and trim at the top and sides of the opening. As much of the trim as possible should be saved to be reused on the enlarged opening. The new opening will be as tall as before but wider.

Set up the work area as described in the module on set up: put down protective sheeting, seal doorways, etc. Lightly mist trim surfaces and pry loose with pry bar and hammer. Remove nails by pulling with the hammer claws or vice grips. Remove trim from the work area for paint removal at the exterior of the residence.

When all of the trim has been removed. Lightly mist sections of wall if demolishing with a sledge hammer. Do not mist if using a saw to cut through the wall. Dispose of debris as it is created by wrapping in protective sheeting, sealing with duct tape, and carrying away from the work site.

After demolition, HEPA vacuum the work site, remove protective sheeting, and HEPA vacuum the surfaces covered by protective sheeting.

3. Remove the old painted wooden cabinets in the kitchen. These built-in cabinets line two walls in the kitchen. The walls will be repainted and new cabinets installed.

Set up the work area as described in the module on set up: put down protective sheeting, seal doorways, etc. Remove cabinet doors and wrap in protective sheeting and carry away from the work area. Mist cabinets and pry loose from walls. Wrap in protective sheeting and carry away from the work site.

After the cabinets are removed, wet scrape and sand any rough areas on the wall in preparation for installation of new cabinets and repainting.

When work is done, HEPA vacuum area, remove protective sheeting, and HEPA vacuum all surfaces.

4. Remove sections of deteriorated siding and peeling paint from the east exterior wall of the house. Water has leaked behind the siding causing large sections to deteriorate. There are two large patches of peeling paint where the siding is still solid. New clapboard siding will be installed later and the entire exterior repainted by a painting contractor.

Set up exterior work area according to set up procedures in module on set up. Remove deteriorated siding by lightly misting and prying loose siding from the structure. Immediately wrap removed siding in protective sheeting and carry away from the work site. Lightly mist, scrape, and sand areas of deteriorated paint. When done, remove protective sheeting and dispose of . NOTE: Safe work practices should also be used when installing new sections of siding.

Exercise 3: Worksheet

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